

US-PAT-NO: 5630037

DOCUMENT-IDENTIFIER: US 5630037 A

TITLE: Method and apparatus for
extracting and treating digital
images for seamless
compositing

DATE-ISSUED: May 13, 1997

INVENTOR-INFORMATION:

NAME	CITY	
STATE	ZIP CODE	COUNTRY
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CA	N/A	N/A

US-CL-CURRENT: 345/592, 345/639 , 348/592 ,
348/598 , 382/164 , 382/171
, 382/282 , 382/283

ABSTRACT:

An image processing system for extracting and treating a digitized color subject image for seamless compositing against an arbitrary background includes the generation of a final control image from the image of a subject in front of a screen consisting of a range of colors. A sample of the background screen is captured and analyzed using filter kernels to determine a range of red, green and blue values which are stored in separate histograms. A first control image is generated by comparing mean histogram data with the subject image. A final control image is generated by dividing the first

control image into separate background, foreground and fringe regions. A treated subject image is generated by leaking color from the local background region into the fringe regions of the subject image using filter kernels. The treated image is suitable for compositing against an arbitrary background image. The composite image may be touched up by using a software brush which on each pass of the brush expands the background region by eliminating immediately adjacent fringe pixels, causes other nearby fringe pixels to increase in translucence, and allows the boundary of the fringe region to encroach on the foreground region. Simultaneously, the brush may also cause fringe pixels to absorb some of the color of neighboring foreground pixels.

21 Claims, 20 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 12

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Brief Summary Text - BSTX (4):

Analog video techniques have existed for many years whereby a live action video signal may be composited against a background of another arbitrary image when the foreground subject is set in front of a colored screen (typically a green or blue screen). For example, a local news weatherman may be composited against a background of a weathermap when the

weatherman is actually standing in front of a blue or green colored screen. In some instances, a table of red, blue and green spectra is produced, and the background color range is interactively selected from the table. The composited image depicts the weatherman in front of the weathermap while the blue or green background is generally eliminated. Such compositing techniques are often referred to as "chroma key" techniques.

Brief Summary Text - BSTX (5):

More recently, techniques have been developed using digital hardware whereby a digitized image may be stored in a framestore or in a memory comprised of pixels, where each pixel consists of three values corresponding to the red, green, and blue intensities at the appropriate pixel location on the video output device when the full color image is displayed. Such techniques, however, have several drawbacks. One drawback is that the screen in front of which the subject is shot must usually be either pure green or pure blue due to the nature of the chroma-key process. A second drawback is that the screen in front of which the subject is shot must be evenly lit. Uneven lighting causes uneven shading of the screen, making it difficult for such systems to distinguish between subject and screen.

Detailed Description Paragraph Equation - DEEQ (13):

result=a.times.fg+(1-a).times.bg